

Problem K

King Permutations

You are given an integer N and a binary string S of length $N - 1$. Let p be a permutation of $(1, 2, \dots, N)$. Count how many different p such that, for all $1 \leq i \leq N - 1$, the following are satisfied.

- If $S_i = 0$, then $|p_i - p_{i+1}| \neq 1$.
- If $S_i = 1$, then $|p_i - p_{i+1}| = 1$.

Output the count modulo 998 244 353.

Input

The first line contains an integer N ($2 \leq N \leq 200\,000$). The second line contains a binary string S of length $N - 1$.

Output

Output an integer representing the count modulo 998 244 353.

Sample Input 1

5
1101

Sample Output 1

6

Explanation of Sample 1: the sequences that satisfy are $(1, 2, 3, 5, 4)$, $(3, 2, 1, 4, 5)$, $(3, 2, 1, 5, 4)$, $(3, 4, 5, 1, 2)$, $(3, 4, 5, 2, 1)$, $(5, 4, 3, 1, 2)$.

Sample Input 2

15
000000000000000

Sample Output 2

510422599



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